

1. Defining the main research questions of the literature review.

- How do you ensure a sufficient level of component obfuscation for each company while maximizing material utilization?
- How can we be sure to minimize the waste, while maximizing material utilization?

2. Defining keywords.

- Cutting Stock Problem (CSP).
- Cutting reusable leftovers.
- Optimized cutting steel plates.
- Rectangular cutting patterns.
- Heuristic cutting patterns.
- CSP in aluminium industry.
- Minimize Cutting Waste.
- Multistage CSP.
- Reusable Leftovers.
- Trim-loss problem.

3. Defining search string.

- (CSP **OR** Multistage CSP **OR** Cutting Stock Problem) **AND** (Cutting reusable leftovers **OR** Reusable Leftovers **OR** Leftovers **OR** Scraps) **AND** (Minimize Cutting Waste **OR** Waste) **AND** (Rectangular cutting patterns **OR** Heuristic cutting patterns **OR** CSP in aluminium industry)

4. Defining search engines.

- Google Scholar
- IEEE Xplore
- Scopus

5. String refinement.

The search results were obtained on 11th May 2023.

- Academic Search Engines used: IEEE, Google scholar and Scopus
- Search string used for academic search: "csp" AND "minimize cutting waste"

Search Engine Result:

Search Engine	Number of result
Google scholars	200
IEEE Xplore	114
Scopus	2

Note: for Google Scholar and Scopus I used the tool [Publish and Perish](#).

A. search results in IEEE:

The screenshot shows the IEEE Xplore Advanced Search page. The search term 'csp' is entered in the first field, and 'minimize cutting waste' is entered in the second field, separated by an 'AND' operator. The search is configured for 'Full Text Only'. The publication year range is set from 2017 to 2023. The search button is visible at the bottom right.

Advanced Search

Enter keywords and select fields.

Search Term: csp in Full Text Only

AND Search Term: minimize cutting waste in Full Text Only

Publication Year

Documents Added Between: 05/03/2023 and 05/10/2023

Specify Year Range

From: 2017 To: 2023

Reset All Search

Feedback

I have stored and **attached** the search result of above as a CSV file to email. Then result from this:

The screenshot shows the IEEE Xplore Search Results page. The search results are displayed for the query 'csp AND minimize cutting waste' from 2017 to 2023. The results are sorted by Relevance. The first result is 'A Comprehensive Review on Renewable Energy Development, Challenges, and Policies of Leading Indian States With an International Perspective' by Rajvikram Madurai Elavarasan et al. The page also includes filters for Conferences, Journals, Books, Standards, and Early Access Articles.

Showing 1-25 of 114 results for ("Full Text Only":csp) AND ("Full Text Only":minimize cutting waste)

Filters Applied: 2017 - 2023

Conferences (44) Journals (33) Books (28) Standards (6) Early Access Articles (3)

Show

All Results Open Access Only

Year

Single Year Range

From: 2017 To: 2023

Author

Affiliation

Select All on Page

Sort By: Relevance

A Comprehensive Review on Renewable Energy Development, Challenges, and Policies of Leading Indian States With an International Perspective

Rajvikram Madurai Elavarasan; G.M. Shafiullah; Sanjeevikumar Padmanaban; Nallapaneni Manoj Kumar; Annapurna Annam; Ajayragavan Manavalanagar Vetrichelvan; Lucian Mihet-Popa; Jens Bo Holm-Nielsen

IEEE Access

Year: 2020 | Volume: 8 | Journal Article | Publisher: IEEE

Cited by: Papers (228)

Abstract HTML PDF

Need Full-Text access to IEEE Xplore for your organization? CONTACT IEEE TO SUBSCRIBE

The Maestro Behind Design-Software Behemoth Synopsys

Feedback

The search results can be found in a CSV file attached in email.

Note: for **Scopus** and **Google Scholar** the tool Publish and Perish is used to obtain the search results.

B. search results in Scopus:

Harzing's Publish or Perish (Windows GUI Edition) 8.8.4384.8527

File Edit Search View Help

My searches

Search terms

Search terms	Source	Papers	Cites	Cites/year	h	g	h _l norm	h _l annual	hA	acc10	Search date
✓ csp AND minimize cutting waste from 2017 to 2023	Scopus	2	8	2.67	2	2	2	0.67	1	0	11/05/2023
✓ csp AND minimize cutting waste from 2015 to 2023	Google Sch...	200	2558	319.75	25	46	14	1.75	10	11	11/05/2023
✓ CSP AND reusable leftovers from 2017 to 2023	Google Sch...	200	3240	540.00	20	55	13	2.17	12	19	09/05/2023

Scopus search

Authors: Years: 2017 - 2023

Affiliations:

Publication name: ISSN:

Title words:

Keywords: csp AND minimize cutting waste

Cites	Per year	Rank	Authors	Title	Year	Publication	Publisher
h 6	2.00	1	S. Sumetthapiwat	A column generation on two-dimensional ...	2020	International Journal of Lo...	
h 2	1.00	2	D. Morillo-Torres	A Mixed-Integer Linear Programming Mod...	2021	Communications in Comp...	

Tools

Preferences...

Online User's Manual

Frequently Asked Questions

Training Resources

YouTube Channel

Become a PoP Supporter

Creating social media profiles

Citation metrics

Publication years: 2020-2021

Citation years: 3 (2020-2023)

Papers: 2

Citations: 8

Cites/year: 2.67

Cites/paper: 4.00

Authors/paper: 1.00

h-index: 2

g-index: 2

h_lnorm: 2

h_lannual: 0.67

hA-index: 1

Papers with ACC >= 1,2,5,10,20: 2,1,0,0,0

Copy Results

Save Results

Paper details

Select a paper in the results list (to the left of this pane) to see its details here.

Copy Paper Details

Then I stored the search result as a CSV file which is attached in the email.

C. search results in Google Scholar:

The screenshot displays the Harzing's Publish or Perish software interface. The main window shows a Google Scholar search for the query "csp AND minimize cutting waste" from 2017 to 2023. The search results are displayed in a table with columns for Cites, Per year, Rank, Authors, Title, Year, Publication, and Type. The top results are:

Cites	Per year	Rank	Authors	Title	Year	Publication	Type
18	3.00	1	S Octari...	The Application to Find Cutting Patterns in Two Dimensional Cutting Stock Problem (si...	2017	Journal ...	r...
8	4.00	2	N Malik...	Minimizing joist cutting waste through dynamic waste allocation in panelized floor man...	2021	Internat...	T...
32	8.00	3	C Le Hes...	Operations scheduling for waste minimization: A review	2019	Journal ...	E...
11	5.50	4	K Kwon...	Cutting Waste Minimization of Rebar for Sustainable Structural Work: A Systematic Liter...	2021	Sustain...	m...
27	5.40	5	ZSM Na...	Minimizing cutting wastes of reinforcing steel bars through optimizing lap splicing withi...	2018	... and ...	E...

The right sidebar shows citation metrics for the search results:

- Publication years: 2017-2023
- Citation years: 6 (2017-2023)
- Papers: 500
- Citations: 11089
- Cites/year: 1848.17
- Cites/paper: 22.18
- Authors/paper: 3.18
- h-index: 47
- g-index: 96
- h₁-norm: 23
- h₁-annual: 3.83
- h₁-index: 22
- Papers with ACC >= 1,2,5,10,20: 286,231,142,82,26

The bottom right pane shows paper details for the selected paper, including the title, authors, and a link to the full text.

I have stored the search result for it in a CSV file attached in email.

6. Search string execution.

IEEE Xplore : I used "csp AND minimize cutting waste" as two keyword at 11.05.2023 in " FULL TEXT ONLY" for 2017-2023 time interval and the number of result was 114.

SCOPUS : I used "csp AND minimize cutting waste" as two keyword at 11.05.2023 for 2017-2023 time interval and the number of result was 2.

Google Scholar : I used "csp AND minimize cutting waste" as two keyword at 11.05.2023 for 2015-2023 time interval and the number of result was 200.

7.Download and store search results

The search result for these 3 search engines has been stored in a CSV file separately and attached by email.

8.Define inclusion and exclusion criteria.

I considered as systematic literature review suggested the following criteria through problem description and main research questions:

First, I consider which papers or articles go to the next stage of review by including : components cut out of pre-manufactured standardized materials (in this case I give the priority to rectangular cuts and plates). Then after considering this, I went through minimizing waste and useful leftovers for the company. Co-operating different companies is also considered with unknown dimensions for their products.

Another inclusion for me is that which papers, articles and etc. are in English language.

Finally, some papers, articles and etc. are restricted the area (Germany).

9.Selection of papers - First stage - Analysis by title and abstract.

Based on previous criteria and abstract of papers:

- DYCKHOFF paper: in this paper based of its abstract, first I tried to categorized and characterized the cutting stock problems (there are no standard form for objective function, constraints or solution approaches etc.)
- REZAEI paper: then in this paper, minimizing production waste, two-dimensional cutting stock problem and finally considering regular (rectangular) and irregular (non-rectangular) shapes for cutting, caught my attention.
- ROTHE paper: usable leftover and even considering the case that leftover materials will be reused in another production cycle or company, check-mated me.

10. Selection of papers - Second stage - Analysis by Introduction and Conclusion. (Optional)

11. Selection of papers - Third stage - Complete reading and quality checklist.

I read all of the three mentioned papers and found them related and usable for my report. Reading and observing all resulted papers takes a huge time of me.

12.Extraction of answers related to research questions.

By considering mentioned above papers, I have created a spreadsheet and showed that each of them signaled me in which direction. Please look over the spreadsheet for this stage (**please check PDF file!**).

Problem description:

Company A **cuts components** (e.g., vehicle parts) out of **pre-manufactured standardized materials plates** (e.g., **rectangular** aluminium plates). They already employ algorithms to perfectly cut the components out of those material plates while **minimizing waste** (essentially, as little as possible is **left over** after cutting out their components). In most cases, there is still enough material left to allow other companies (e.g., company B and company C) to cut out further pieces for their own products. However, neither companies A, B, nor C would be happy to **disclose the exact dimensions** of their products to anyone. Therefore, we need to **obfuscate the dimensions of each company's products** while utilising as many materials plates as possible (**minimizing leftovers**).

How do you ensure a sufficient level of component obfuscation for each company while **maximizing material utilization**?